

a pronounced dilatation of the denervated pupil followed in 2 to 3 minutes by a slow contracture in the denervated face.

(5) The denervated face was also used as an end point in the determinations of rates of hydrolysis of acetylcholine by blood, and other body tissues and fluids. The great advantage of this preparation is that small (physiologic) amounts of acetylcholine could be used in these determinations and the indicator reaction is almost specific for acetylcholine.

Summary. (1) A preparation is described in which sympathomimetic and parasympathomimetic substances could be detected in the blood. (2) Any discharge of either or both of these substances under various physiologic states was indicated by dilatation of the denervated pupil or by contraction in the facial muscles respectively. (3) Under emotional stress, the cat exhibited predominantly sympathetic activity while the monkey showed parasympathetic activity in their denervated structures. (4) The denervated facial muscles were used as indicators of end points in the determinations of rates of hydrolysis by sera and cerebrospinal fluids.

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A Bacterial Enzyme Which Converts Creatine into its Anhydride Creatinine.*

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We have previously described the preparation from two bacterial species (NC and HR) of enzymic systems that are highly specific for the decomposition of creatine and creatinine.^{1, 2} These enzymic systems function only under aerobic conditions and convert creatine and creatinine into urea, ammonia, and other compounds. We have now observed that the washed cells of the NC bacterial species are capable of converting creatine into creatinine under anaerobic conditions; the creatinine so produced can then be decomposed by the same bacterial suspension when the conditions are rendered aerobic.

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¹ Miller, B. F., and Dubos, R. J., *Proc. Soc. Exp. Biol. and Med.*, 1936, **35**, 335.

² Dubos, R. J., and Miller, B. F., *J. Biol. Chem.*, 1937, **121**, 429.

The new enzyme has been obtained in aqueous solution, free of the cellular structure, by killing the cells with cold acetone, or with toluol and chloroform.

This enzyme appears to exhibit a high degree of specificity for creatine, since it does not convert the closely related compound glycocyanine into glycocyanidine, nor does it change hydantoic acid into its anhydride, hydantoin. The enzyme does not produce creatine or creatinine from arginine, a possible precursor of creatine in the animal body. Methyl guanidine and acetic acid, component parts of creatine, are not synthesized into the latter compound by the enzyme.

The enzyme is not produced when the bacterial cells are grown in a medium which does not contain creatine; it seems, therefore, to belong to the group of "adaptive enzymes" which are produced only in the presence of their specific substrate.

The conversion of creatine into creatinine offers an opportunity for the study *in vitro* of (a) the enzymatic production of a biologically important cyclic compound from an aliphatic one, and (b) the enzymatic combination of an amino and a carboxyl group to form the important CO-NH linkage.

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Changes in the Ant. Pituitary Gland of Rats with Experimental Goiter.

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The relationship of the thyroid to the pituitary gland has been explored by various methods. Earliest mention of this relationship is found in the description of the hypophysis¹ in pathologic conditions of the thyroid gland. Large, pale cells with nuclei poor in chromatin were noted in the anterior hypophyses in cases of thyroid deficiency.² Similar observations were made in dogs with spontaneous goiter.³ Following thyroidectomy, the disappearance of

¹ Niepce, B., *Traite du goitre et du cretinisme*, Paris, J. B. Bailliere, 1851.

² (a) MacCallum, W. G., and Fabry, M., *Bull. Johns Hopkins Hosp.*, 1907, **18**, 341; (b) Schilder, P., *Virchows Arch. f. path. Anat.*, 1911, **203**, 246; for review see (c) Brauchli, H., *Frankfurt Ztschr. f. Path.*, 1925, **31**, 450.

³ Romeis, B., *Virchows Arch. f. path. Anat.*, 1924, **251**, 237.